

# Notice of Allowability

Application No.

09/923,060

Examiner

Samuel Broda

Applicant(s)

MALTHE-SORENSEN ET AL.

Art Unit

2123

## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the divisional Application and Preliminary Amendment filed 6 August 2001.
2. ☒ The allowed claim(s) is/are 33-35 and 44-47.
3. ☒ The drawings filed on 06 August 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 12/10/2001
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.



**SAMUEL BRODA, ESQ.  
PRIMARY EXAMINER**

Art Unit: 2123

### **DETAILED ACTION**

1. Claims 33-35 and new claims 44-47, presented in a Preliminary Amendment mailed on 6 August 2001 and in response to a restriction requirement made in parent Application 09/542,307, have been examined.

#### ***Examiner's Amendment***

2.1 An Examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to Applicants, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The first Examiner's amendment corrects the "Cross-References to Related Applications" in the Specification to properly denote the U. S. Patent number of the parent Application.

The second Examiner's amendment changes the language of the preamble of independent 33 to more clearly identify the statutory subject matter of the claim. Authorization for this Examiner's amendment was given in a 16 March 2005 telephone conversation with Mr. Kaushik Sriram, Reg. No. 43,150.

Art Unit: 2123

2.2 The application has been amended as follows:

In the Specification under the “Cross References to Related Applications”, change:

“Patent No. \*\*\*\*\*”

to:

--Patent No. 6,370,491--.

In Claim 33, line 1, change:

“A method”

to:

--A computer-implemented method--.

In Claim 33, line 3, change:

“modeled by”

to:

--modeled in the computer by--.

### ***Reasons for Allowance***

3. The following is an Examiner’s statement of reasons for the indication of allowable subject matter:

The closest prior art of record shows:

(1) a materials design system using lattice relaxation (Nozaki, U. S. Patent 6,038,514);

Art Unit: 2123

(2) a topologically-based framework for simulating complex geological processes such as the temperature and pressure field surrounding an evolving salt dome (Mello et al, “A Topologically-based Framework for Simulating Complex Geological Processes”);

(3) use of a finite element mesh to solve soil structure interaction problems (Anonymous, “Engineering and Design - Geotechnical Analysis by the Finite Element Method”); and

(4) a finite element model incorporating the deformation of overlying strata and its influence on ground waterflow via a relationship between mining-induced strains and changes of hydraulic conductivity (Matetic et al, “Modeling the Effects of Longwall Mining on the Ground Water System”).

### 3.1 Applicants’ set of claims consists of claims 33-35 and 44-47.

Independent claim 33 is directed to a computer-implemented method of simulating deformation without faulting and fracturing due to an initial deformation pattern applied to boundaries of a subsurface volume. This claim identifies the distinct limitations of: “defining a plurality of boundary nodes on a boundary of said subsurface volume wherein said initial deformation pattern is applied” and “determining a displacement for each of the plurality of interconnected nodes as a combination of said displacement of said boundary nodes weighted by a weighing function related to said distance from each of the plurality of interconnected nodes and the final positions of the boundary nodes.”

Art Unit: 2123


Because the closest prior art does not appear to teach or suggest simulating a deformation of a subsurface volume using an initial deformation and a weighting function related to the interconnected nodes and boundary nodes, claims 33-35 and 44-47 are deemed allowable.

4. Any comments considered necessary by Applicants must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

5. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Samuel Broda, whose telephone number is (571) 272-3709. The Examiner can normally be reached on Mondays through Fridays from 8:00 AM – 4:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kevin Teska can be reached at (571) 272-3716. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist, whose telephone number is (571) 272-2100.

  
**SAMUEL BRODA, ESQ.**  
**PRIMARY EXAMINER**